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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,804	01/30/2004	Norman Rubin	00100.03.0041	9333

29153 7590 01/12/2007
ADVANCED MICRO DEVICES, INC.
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EXAMINER

NGUYEN, PHILLIP H

ART UNIT PAPER NUMBER

2191

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/768,804	RUBIN ET AL.	
	Examiner	Art Unit	
	Phillip H. Nguyen	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20051207</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the original filing of January 30, 2004. Claims 1-21 are pending and have been considered below.

Specification

2. The incorporation of essential material in the specification by reference to an published U.S. application is improper (In paragraph 0022, Applicant refers to the U.S. Patent Application for descriptions of "previous bit" and "write mask"). Applicant is required to amend the disclosure to include the material incorporated by reference, if the material is relied upon to overcome any objection, rejection, or other requirement imposed by the Office. The amendment must be accompanied by a statement executed by the applicant, or a practitioner representing the applicant, stating that the material being inserted is the material previously incorporated by reference and that the amendment contains no new matter. 37 CFR 1.57(f).

Claim Objections

3. Claims 1, 10, and 19 are objected to because of the following informalities: It recites the word "for" in the body of the claim, which indicates intended use and as such does not carry patentable weight. The limitation following the phrase "for" describes only intended use but not necessarily required functionality of the claim. Since, the limitation following the phrase "for" do not carry patentable weight, which causes the claim appears as a series of non-functional descriptive material/data without any

functional relation with each other. Applicant is required to amend the claim so that the claim limitations are recited in a definite form. For example, "for superword register value numbering" should be changed to "to superword register value number".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

6. Claim 1 is non-statutory subject matter because the language of the claim raises a question as to whether the claim is directed to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form a basis of statutory subject matter under 35 U.S.C. 101. For instance, "searching a second hash table using the result value number" represents an abstract idea because the outcome is not realized as a monitoring or controlling or any other tangible output that would provide a utility. Therefore the claim is non-statutory. Additional item to consider is the intended use. The word "for" is recited in the preamble, which indicates intended use and as such does not carry patentable weight. The limitation following the phrase "for" describes only the intended use but not necessarily required functionality of the claim. The

limitations following the phrase "for" do not carry patentable weight, which cause the claim appears as a series of non-functional descriptive material/data without any functional relation with each other. Claims 2-9 directly depend on claim 1 and therefore have been address in connection with the rejection set forth in claim 1.

7. Claim 10 recites the same limitations as in claim 1 above, and therefore, suffers the same rejection. Claims 11-18 directly depend on claims 10, and therefore, have been addressed in connection with the rejection set forth in claims 10.

8. Claim 19 is non-statutory subject matter because the language of the claim raises a question as to whether the claim is directed to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form a basis of statutory subject matter under 35 U.S.C. 101. For instance, "if the result value number is..., writing the operation value number to the second hash table" is not a practical application. It is an abstract idea because the outcome is not realized as monitoring or controlling or any other tangible output that would provide a utility. Therefore, the claim is non-statutory. Claims 20-21 directly depend on claim 19, and therefore, have been addressed in connection with the rejection set forth in claim 19.

9. Claim 2, 3, 6, 11, 12, 15, and 20 are non-statutory subject matter because the language of the claims raises a question as to whether the outcome is a practical

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application (concrete, useful, and tangible). For example, claim 2 recites, "if the result value number is found... retrieving an output of the instruction from..." is lacking of concreteness because the outcome is unpredictable. An alternative path is when the result value number is not found, which raises a question as to whether or not the retrieving process is taking place.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 2, 3, 6, 11, 12, 15, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

12. Claims 2 and 11 recite, "if the result value number is found... retrieving an output of the instruction from the second hash table" is unclear as to whether the retrieving process still perform when the result value number is not found.

13. Claims 3 and 12 recite, "if the result value number is not found... writing the operation value number to the second hash table" is also unclear as to whether the writing process still perform when the result value number is found.

14. Claims 6, 15 recite, "if the first hash value is not within the first hash table, assigning the first hash value to a multiple component has value" is unclear as to whether assigning process still perform when first hash value is found.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1-7, 9-15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ng (United States Patent No.: 6,035,124).

As per claim 1:

Ng discloses a method for superword register value numbering, the method comprising:

- hashing an operation code and value numbers of a plurality of sources to generate a first hash value ("**hashing for x_2+y_0 obtains two different values for x_0+y_0 and x_1+y_0 , respectively**" Col 6, line 13-14; **also see TABLE A for more details**);
- retrieving an operation value number from a first hash table based on the first hash value ("**A hash table is used to speed up the storing and retrieval of value numbers**" Col 7, line 51-52; "**if value numbers are not equal, then a**

new value number is formed and assigned if not already assigned" Col 8, line 27-28, this means, retrieving the value number from the hash table must performed in order to compare the value numbers);

- generating a result value number based on a previous bit hash value and the operation value number (**"if value numbers are not equal, then a new value number is formed and assigned if not already assigned" Col 8, line 27-28); and**
- searching a second hash table using the result value number (**"redundancy may be determined by a lookup each time any code is moved" Col 10, line 26, the idea is look up the hash table for determining redundancy).**

As per claim 2:

Ng discloses the method as in claim 1 above; and further discloses:

- if the result value numbering is found within the second hash table, retrieving an output of the instruction from the second hash table (**"if a value number has been assigned to the LHS (left hand side), then processing continues to decision block 525 to determine if any right hand side (RHS) operands of the current expression have an unknown value number" Col 9, line 36-38, this means, if a value number is found, a determination of RHS operands is performed, and in order to perform the determination, the value number of the operands must retrieve from the hash table to compare).**

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As per claim 3:

Ng discloses the method as in claim 1 above; and further discloses:

- if the result value numbering is not found within the second has table, writing the operation value number to the second hash table (**"if no value number has been assigned to the LHS (left hand side), then process block 520 creates and assigns a new unique value number to the LHS"** Col 9, line 22-24).

As per claim 4:

Ng discloses the method as in claim 1 above; and further discloses:

- prior to generating a result value number, retrieving the previous bit hash value (**it is inherent in Ng's method. In order to generate a new value number, previous bit hash value must retrieve to perform the comparison** Col 8, line 27-28).

As per claim 5:

Ng discloses the method as in claim 1 above; and further discloses:

- prior to retrieve the operation value number, comparing the first hash value with a first hash table (**it is inherent in Ng's method. In order to generate a new value number, a comparison between the hash value number with the hash table must perform to find out if it is redundant** Col 8, line 27-28).

As per claim 6:

Ng discloses the method as in claim 1 above; and further discloses:

- if the first hash value is not within the first hash table, assigning the first hash value a multiple component has value (**"if value numbers not equal, then a new value number is formed and assigned if not already assigned"** Col 8, line 27-28).

As per claim 7:

Ng discloses the method as in claim 1 above; and further discloses:

- wherein the operation value number is an n-tuple number (**"xi (i.e., x0, x1, x2,...)"** Col 6, line 3; **"All expressions that look lexically the same (e.g., x0+y0, x1+y1, x2+y2) together with all other expressions sharing the same value numbers with these lexically similar expressions"** Col 6, line 51-54).

As per claim 9:

Ng discloses the method as in claim 1 above; and further discloses:

- wherein the operation code and the value numbers are disposed within an instruction, the instruction further including a previous bit and a write mask (**(see for example, FIG. 6, and texts for further expand it features, "Hash Table"** Col 19, line 20-67).

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As per claim 10:

Ng discloses an apparatus for superword register value numbering, the apparatus comprising:

- at least one memory device storing a plurality of executable instruction (**"the computer system 1000 includes a processor 1002"** Col 27, line 24); and
- at least one processor operably couple to the at least one memory device (**"memory in the form of a hard disk file storage 1008...is connected to the processor 1002"** Col 27, line 26-28), operative to receive the plurality of executable instructions such that the processor, in response to the executable instructions:
 - o hashes an operation code and value numbers of a plurality of sources to generate a first hash value (**"hashing for x_2+y_0 obtains two different values for x_0+y_0 and x_1+y_0 , respectively"** Col 6, line 13-14; also see TABLE A for more details);
 - o retrieves an operation value number from a first hash table based on the first hash value (**"A hash table is used to speed up the storing and retrieval of value numbers"** Col 7, line 51-52; **"if value numbers are not equal, then a new value number is formed and assigned if not already assigned"** Col 8, line 27-28, this means, retrieving the value number from the hash table must performed in order to compare the value numbers);

- generates a result value number based on a previous bit has value and the operation value number (**"if value numbers are not equal, then a new value number is formed and assigned if not already assigned"** Col 8, line 27-28); and
- searches a second hash table using the result value number (**"redundancy may be determined by a lookup each time any code is moved"** Col 10, line 26, **the idea is look up the hash table for determining redundancy**).

As per claims 11-15:

Recite the same limitation as recited in claim 2-6 respectively and have been addressed in connection with rejection set for the claims 2-6.

As per claim 18:

Ng discloses the apparatus as in claim 10 above; and further discloses:

- at least one has memory device operably coupled to the at least one processor such that the at least one hash memory device is operative to store the first hash table and the second hash table (**see for example, FIG. 6; "Hash Table 600" and "HashLinks 605"** Col 19, line 21-22).

As per claim 19:

Ng discloses the method for superword register value numbering, the method comprising:

- hashing an operation code and value numbers of a plurality of sources to generate a first hash value (**“hashing for x_2+y_0 obtains two different values for x_0+y_0 and x_1+y_0 , respectively”** Col 6, line 13-14; also see **TABLE A** for more details);
- comparing the first hash value with a first hash table (**it is inherent in Ng’s method. In order to generate a new value number, a comparison between the hash value number with the hash table must perform to find out if it is redundant** Col 8, line 27-28);
- retrieving an operation value number from a first hash table based on the first hash value (**“A hash table is used to speed up the storing and retrieval of value numbers”** Col 7, line 51-52; **“if value numbers are not equal, then a new value number is formed and assigned if not already assigned”** Col 8, line 27-28, this means, retrieving the value number from the hash table must performed in order to compare the value numbers);
- retrieving the previous bit hash value (**it is inherent in Ng’s method. In order to generate a new value number, previous bit (can be previous value number or opcode or any operand value) hash value must retrieve to perform the comparison** Col 8, line 27-28)

- generating a result value number based on a previous bit hash value and the operation value number (**"if value numbers are not equal, then a new value number is formed and assigned if not already assigned"** Col 8, line 27-28); and
- searching a second hash table using the result value number (**"redundancy may be determined by a lookup each time any code is moved"** Col 10, line 26, **the idea is look up the hash table for determining redundancy**);
- if the result value numbering is found within the second hash table, retrieving an output of the instruction from the second hash table (**"if a value number has been assigned to the LHS (left hand side), then processing continues to decision block 525 to determine if any right hand side (RHS) operands of the current expression have an unknown value number"** Col 9, line 36-38, **this means, if a value number is found, a determination of RHS operands is performed, and in order to perform the determination, the value number of the operands must retrieve from the hash table to compare**); and
- if the result value numbering is not found within the second has table, writing the operation value number to the second hash table (**"if no value number has been assigned to the LHS (left hand side), then process block 520 creates and assigns a new unique value number to the LHS"** Col 9, line 22-24).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 8, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng (United States Patent No.: 6,035,124), in view of Dinkjian et al. (United States Patent No.: 5,465,374).

As per claim 8:

Ng discloses the method as in claim 1 above, but does not explicitly disclose the use of write mask.

However, Dinkjian discloses an analogous method using write mask for writing data into memory ("**the write mask is used in the MOVE instruction to write the data string into a new memory location**" Col 4, line 14-15).

Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify Ng's method to include write mask in the instructions to store a Boolean value for value numbering. One of ordinary skill in the art would have been motivated to use write mask to write data to memory.

As per claims 16 and 21:

Recite the same limitations as recited in claim 8, and therefore, has been addressed in connection with the rejection set forth in claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip H. Nguyen whose telephone number is (571) 270-1070. The examiner can normally be reached on Monday - Thursday 10:00 AM - 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PN

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A handwritten signature in black ink, appearing to read 'W. Zhen' with a stylized flourish at the end.

WEI ZHEN
SUPERVISORY PATENT EXAMINER